AMP2A and AMP2A-2S

2U Stereo Audio Speaker Monitors

with Two Analog Inputs and Loop-through Outputs on XLR (AMP2A) or Two Pair (Selectable) Analog Inputs and Selected Stereo Outputs on XLR (AMP2A-2S), Dual 20-Segment LED Level Meters and Phase Indication

Document P/N **821553** Rev-**B**

User Manual

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Important Safety Instructions

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings.
4) Follow all instructions.
5) Do not use this apparatus near water.
6) Clean only with dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat source such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched, particularly at plugs convenience receptacles and the point where they exit from the apparatus.
11) Only use attachments/accessories specified by the manufacturer.
12) Use only with the cart stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13) Unplug this apparatus during lightning storms or when unused for long periods of time.
14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15) Do not expose this apparatus to rain or moisture.
16) The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

CAUTION!

In products featuring an audio amplifier and speakers, the surface at the side of the unit, where the audio amplifier heat sink is internally attached, may get very hot after extended operation. When operating the unit excercise caution when touching this surface and ensure that external materials which may be adversely affected by heat are not in contact with it. There is a Hot Surface label (see diagram) attached to the aforementioned surface of the product.

Introduction

Congratulations on your selection of a Wohler Technologies product. We are confident it represents the best performance and value available, and we guarantee your satisfaction with it.

If you have questions or comments you may contact us at:

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Section 1

General Features and Specifications

Description
Features
Applications
Specifications
Other Options

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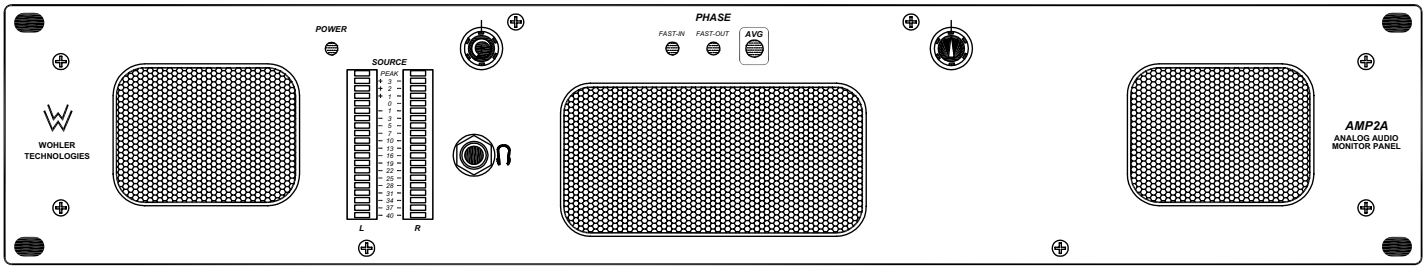
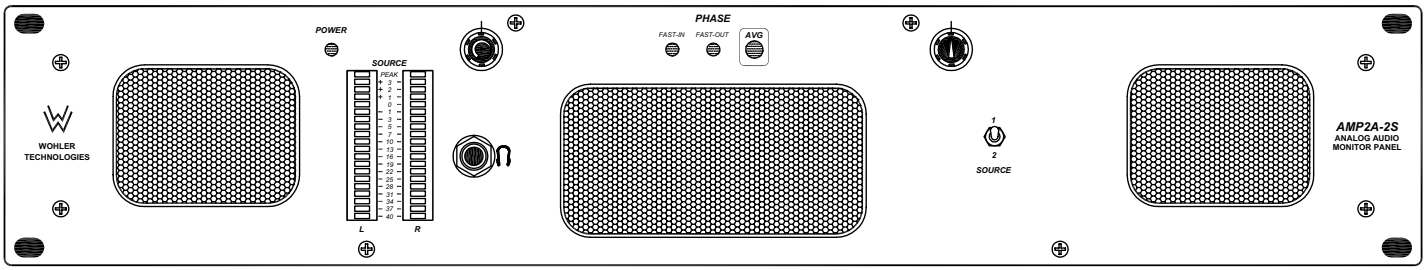
AMP2A and AMP2A-2S

2U Stereo Audio Speaker Monitors



AMP2A Front Panel



AMP2A-2S Front Panel

Description

The **AMP2A Series** units are complete, exceptionally high quality stereo audio monitoring systems in compact, two rackspace cabinets. These models contain three audiophile-quality drivers and three power amplifiers; two amplifiers (and two speakers) that reproduce midrange and high frequency information in stereo, and a third amp/driver combination (and speaker) that handles summed Low Frequency (LF) information below the 500 Hz crossover point. The **AMP2A Series** unique audio design has two important advantages. First, it provides optimally focused sound in an Ultra Near Field [tm] (1 to 3 feet) environment. This allows higher SPL for the operator while reducing overall ambient sound and adjacent bay crosstalk. Second, electronic rather than acoustic cancellation of bass frequencies provides positive audible detection of reversed polarity ("out of phase") audio feeds. A unique LED display also visually shows "phase" (polarity) relationships of the signals selected for monitoring.

The **AMP2A** and **AMP2A-2S** models are both audio monitors capable of monitoring two analog source channels through the stereo speaker system while simultaneously visually monitoring both channels via two 20-segment tri-color LED bargraph level meters. The **AMP2-2S** model features a toggle switch on the front panel to allow selection of an additional pair of analog input sources.

The rear panel for the **AMP2A** model features two analog inputs on balanced XLR and unbalanced RCA connectors and two loop-through outputs on XLR connectors. The rear panel for the **AMP2A-2S** model features two selectable pairs of analog inputs on XLR inputs and a stereo output of the selected sources on two XLR connectors.

Features

- AMP2A model features balanced analog inputs on XLR connectors and unbalanced inputs on RCA connectors with loop-through outputs on XLR connectors
- AMP2A-2S model features two selectable pairs of balanced analog inputs on XLR connectors with two outputs of the selected source on XLR connectors
- AMP2A-2S model offers front panel switching between the two stereo inputs
- Two 20-segment LED bargraph display level meters
- Volume and balance controls
- Stereo phase indication LEDs
- Headphone output
- Power indication LED
- 98 dB SPL at two feet
- Only two rack spaces high
- Excellent high frequency response for positive detection of background whine and noise
- Audible indication of phase/polarity problems
- Thorough magnetic shielding for placement next to video monitors
- Numerous alternate control and input options
- Quick and easy installation: simply slide in the rack and connect audio and AC power

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Applications

The **AMP2A Series** units are ideally suited for use in VTR bays, mobile production vehicles, teleconferencing installations, multimedia systems, satellite links and cable TV facilities, and on-air radio studios. Designed and manufactured in the U.S., **AMP2A Series** units are backed by a strong warranty and a satisfaction guaranteed return policy.

General Specifications

Analog Input Connectors:	XLR-F and RCA (AMP2A only)
Analog Input Impedance:	XLR: 200KΩ, balanced RCA: 47KΩ, unbalanced (AMP2A Only)
Peak Acoustic Out (@ 2 ft.):	104 dB SPL
Power Output, **RMS Each Side (4Ω):** **RMS Bass (4Ω):**	 14 W transient / 10 W continuous 35 W transient / 25 W continuous
Frequency Response, Sixth Octave:	80 Hz - 16 kHz ± 5 dB) (-10 dB @ 40 Hz, 20 kHZ)
Input Level for Maximum Output (Volume Full On):	0 dBv balanced / -10 dB unbalanced
Hum and Noise (analog):	Better than -68 dB below full output
Distortion, Electrical:	Less than 0.15% at any level below input threshold
Distortion, Acoustic:	6% or less at worst case frequencies above 120 Hz, including cabinet resonance; typically less than 1.5%
Input Overload:	+26 dBv balanced
Analog Out S/N:	>90 dB
Analog Out THD:	<0.008%
Magnetic Shielding:	<0.8 Gauss any adjacent surface
Power Consumption (Average Maximum):	45 W
AC Mains Input:	100-240VAC, 50-60 Hz Universal

Level Meter Specifications

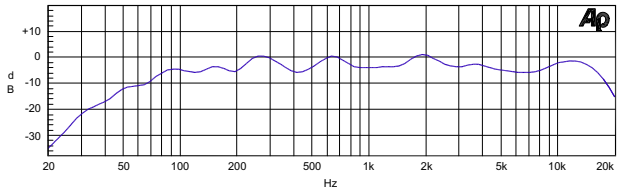
Level Meter Type:	20-Segment LED bargraph
Meter Dynamics:	VU or PPM, selectable
Input Level Gain:	-6, 0, +4, +8 dBu, selectable
Dynamic Range:	44 dB
Midscale Resolution:	1 dB
Segment Colors:	Tricolor (green, amber, red)
Scale:	+4 (peak) to -40 dB

Note: See page 17 for additional bargraph information.

Physical Specifications

Weight:	18 lbs. (8.2 kg)
Dimensions (HxWxD):	3.5 x 19 x 12 inches (89 x 483 x 305 mm)

Audio Response Curve



Typical 1/6 Octave Audio Response Curve

Units are designed to meet, at time of manufacture, all currently applicable product safety and EMC requirements, such as those of CE. 0 dbV ref. 0.775V RMS. Features and specifications subject to improvement without notice.

Other Options

Wohler Technologies offers by far the broadest range of standard production audio monitor units. Custom combinations of connectors, controls and level meters are available by special order. Standard-production models or special order custom features for the AMP2A series (2U) units include the following functions (and combinations thereof):

- Transformer coupled analog inputs
- Separate channel volume controls
- Mono, mute, and mode switches
- Alternate level meter scales and color maps
- FULL output power DC operation
- External speaker capability
- Multiple input and output connector type choices

Other custom options are possible. Call your dealer or Wohler Technologies to discuss your specific needs.

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Section 2

Operation

Installation

Front Panel Features

Rear Panel Features

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Installation

Mounting

The unit should be mounted where convenient for operating persons, ideally at approximately ear/eye level for best high frequency response and visual observation of the level meters. Its superior magnetic shielding eliminates concerns about locating it adjacent to most types of CRT monitors, including even high-resolution color monitors.

NOTE: Be sure to set the level meter Input Level Gain Calibration and VU/PPM Display Mode DIP switch (accessed through the top cover) BEFORE installing the unit into an enclosed rack or console. See page 17 for setting information.

Heat Dissipation

Heat dissipated by the speaker amps is conducted directly to the left side of the chassis; no special considerations for cooling are necessary as long as the ambient temperature inside the rack area does not exceed approximately 40°C (104°F).

Sympathetic Vibration

Sympathetic vibration from other equipment (cables, etc.,) in the rack may be serious enough to interfere with the unit's sound quality out in the listening area. The use of thin card stock and/or felt or foam weather-stripping type materials between adjacent vibrating surfaces, or tying up loose cables, etc., may be required to stop vibrations external to the unit.

Mechanical Bracing

Even though the unit is fairly heavy, the chassis is securely attached to the front panel at eight points along its surface, not just at the four corners of the chassis ears. This feature will reduce or eliminate rear bracing requirements in many mobile/portable applications. The weight of internal components is distributed fairly evenly around the unit.

Audio Connections

Connection of the audio feeds is straightforward. Please refer to the system interconnect block diagrams on pages 20 and 21 for clarification of the general signal paths into and out of the AMP2A and AMP2A-2S units.

Analog inputs via the 3-pin female XLR connectors are configured for 200K Ω balanced connections. RCA connector inputs (AMP2A only) are configured for 47K Ω unbalanced connections.

Electrical Interference

Care should be exercised to avoid mismatched cable types and other similar causes of undesired reflections in RF signal systems. If severe enough, such reflections can result in undesirable electrical interference in the audio signals.

As with any audio equipment, maximum immunity from electrical interference requires the use of shielded cable; however, satisfactory results can sometimes be obtained without it. The internal circuitry common is connected to the chassis.

AC Power

The unit's AC mains connection is via a standard IEC inlet, with safety ground connected directly to the unit's chassis. The universal AC input (100-240VAC, 50/60Hz) switching power supply is a self-resetting sealed type, with automatic over-voltage and over-current shutdown. There is no user-replaceable fuse in either the primary or secondary circuit.

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Front Panel Features

Please refer to Figure-2a on the following page to familiarize yourself with the front panel features of the AMP2A and AMP2A-2S units. The following sections describe these features and are referenced, by number, to Figure-2a.

1 Speakers

The AMP2A series internal speaker system is comprised of two mid-range tweeter speakers (left and right) and one woofer speaker (center). The two side channel speakers reproduce, in stereo, only the mid and high frequencies.

2 Power Indication LED

This LED glows green to indicate the AMP2A series unit is connected to mains power and an operation voltage is present.

3 Audio Level Meter LED Bargraph Displays (1-2)

Audio levels for the selected 2-channel source is visually displayed via these two 20-segment, tri-color LED bargraph meters. Dynamic range for these meters is 44 dB and they are able to display signal levels using either PPM or VU standards. VU/PPM Display Mode and Input Level Gain Calibration for each of the two meter bargraphs is user selectable via two DIP switch modules accessible through the top cover of the unit (see page 17 for DIP switch settings).

Contact the factory for additional information concerning meter scales and ballistics.

4 Volume Control Pot

This controls the loudness of the audio reproduced by the internal speakers or connected headphone. Clock-wise rotation of this control increases the loudness of the monitored audio.

5 Headphone Jack

Select the headphone audio sources as you would for the internal speakers. When you plug in headphones, the speakers will mute. This jack accepts a standard 1/4” phone type stereo plug.

6 Phase Indication LEDs

These three LEDs offer instant verification of phase (polarity) conditions in the pair of channels selected for monitoring in the Left/Right channel speakers. There are three LEDs; the two smaller LEDs labeled "**FAST-IN**" and "**FAST-OUT**" show instantaneous phase relationships in the signal, while the larger LED, labeled "**AVG**", will indicate the ***average*** phase condition. The small "**FAST-IN**" LED glows (or blinks) GREEN when signals are *in-phase*. The small "**FAST-OUT**" LED glows (or blinks) AMBER for *out-of-phase* signals. The larger "**AVG**" LED indicates the *average* phase condition by glowing GREEN for *in-phase* conditions, or RED for *out-of-phase* conditions. In general, it is sufficient to regard the "**AVG**" LED (average phase condition) as adequate for proper phase monitoring. While it is normal for stereo signals to contain some intermittant instantaneous out-of-phase and in-phase conditions (small LEDs), a steady red glow of the larger LED almost always indicates an out-of-phase alarm condition.

7 Balance Control Pot

This control pans the volume balance between the left and right speakers.

8 Source Select Switch (AMP2A-2S Only)

On the AMP2A-2S model, this 2-position toggle switch selects either the **SOURCE 1** or **SOURCE 2** inputs (Item E, page 12) for monitoring through the speakers (or headphones) and level meters.

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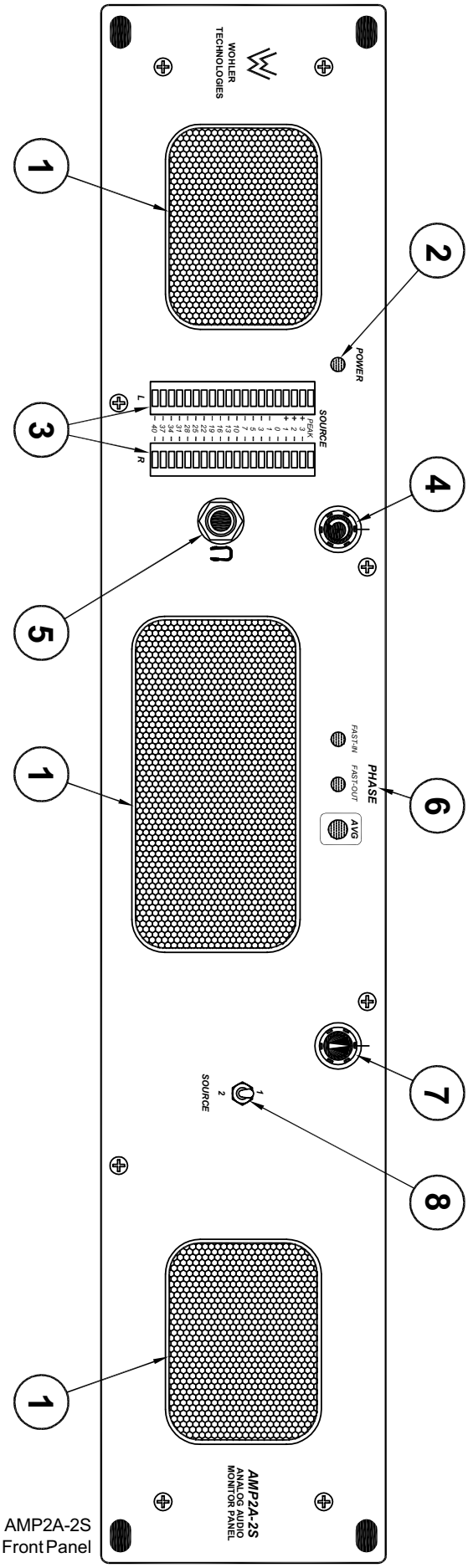
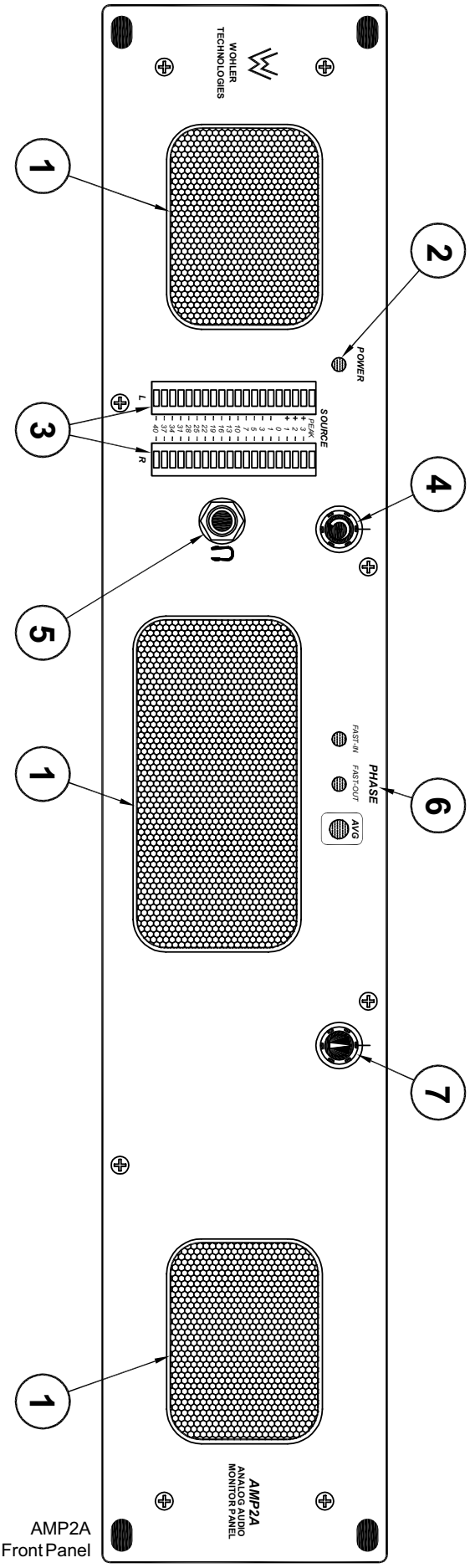


AMP2A-2S Front Panel



AMP2A Front Panel

Figure-2a: Front Panel Features

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Rear Panel Features

Please refer to Figure-2b on the following page to familiarize yourself with the rear panel features of the AMP2A and AMP2A-2S units. The following sections describe these features and are referenced, by letter, to Figure-2b.

A Power Connector

Attach a standard IEC-320 power cord between this connector and mains power (100 - 250VAC, 50/60 Hz). The front panel **Power Indication LED** (Item 2, page 10) will glow GREEN to indicate operating voltages are present.

B Analog Input Connectors - Balanced XLR (AMP2A Only)

These two 3-pin female XLR connectors (**BALANCED IN, CHANNEL A (Left) and CHANNEL B (RIGHT)**) accept standard analog audio signals and are configured for balanced 200K Ω connections. Pinout information for these connectors is shown at bottom of this page.

Note: For each input section **(CHANNEL A (Left)** ***or*** **CHANNEL B (RIGHT))**, you cannot connect analog sources simultaneously to the unbalanced inputs (Item D) and these balanced inputs.

C Analog Loop-Through Output Connectors (AMP2A Only)

These two 3-pin male XLR connectors (**LOOP-THRU, CHANNEL A (Left) and CHANNEL B (RIGHT)**) output an audio loop-through of the signals entering the **Analog Input Connectors** (Item B). Both connectors are configured for low impedance connections and the output signals are not affected by the volume/balance controls or headphone mute. Pinout information for these connectors is shown at bottom of this page.

D Analog Input Connectors - Unbalanced RCA (AMP2A Only)

These two female RCA connectors (**UNBALANCED IN, CHANNEL A (Left) and CHANNEL B (RIGHT)**) accept standard analog audio signals and are configured for unbalanced 47K Ω connections. Pinout information for these connectors is shown at bottom of this page.

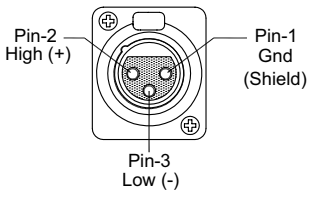
Note: For each input section **(CHANNEL A (Left)** ***or*** **CHANNEL B (RIGHT))** You cannot connect analog sources simultaneously to the balanced inputs (Item B) and these unbalanced inputs.

E Analog Input Connectors - Balanced (AMP2A-2S Only)

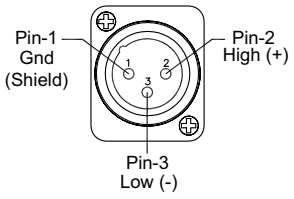
All four of these 3-pin female XLR connectors (**SOURCE 1 or 2, CHANNEL A (Left) and CHANNEL B (RIGHT)**) accept standard analog audio signals and are configured for balanced 200K Ω connections. Note that the **Source Select Switch** on the front panel (Item 8, page 10) is used to select either **SOURCE 1** or **SOURCE 2** inputs for monitoring through the AMP2-2S unit. Pinout information for these connectors is shown at bottom of this page.

F Selected Output Connectors

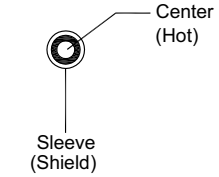
These two 3-pin male XLR connectors are analog outputs of the **Analog Input Connectors** (Item E) as selected by the **Source Select Switch** (Source **1** or **2**) on the front panel (Item 8, page 10). The left connector outputs the left channel (channel A) and the right outputs the right channel (channel B). Both connectors are configured for low impedance connections and the output signals are not affected by the volume/balance controls or headphone mute. For XLR connector pinout information see the diagram below.



Female XLR Pinout



Male XLR Pinout



Female RCA Phono Pinout

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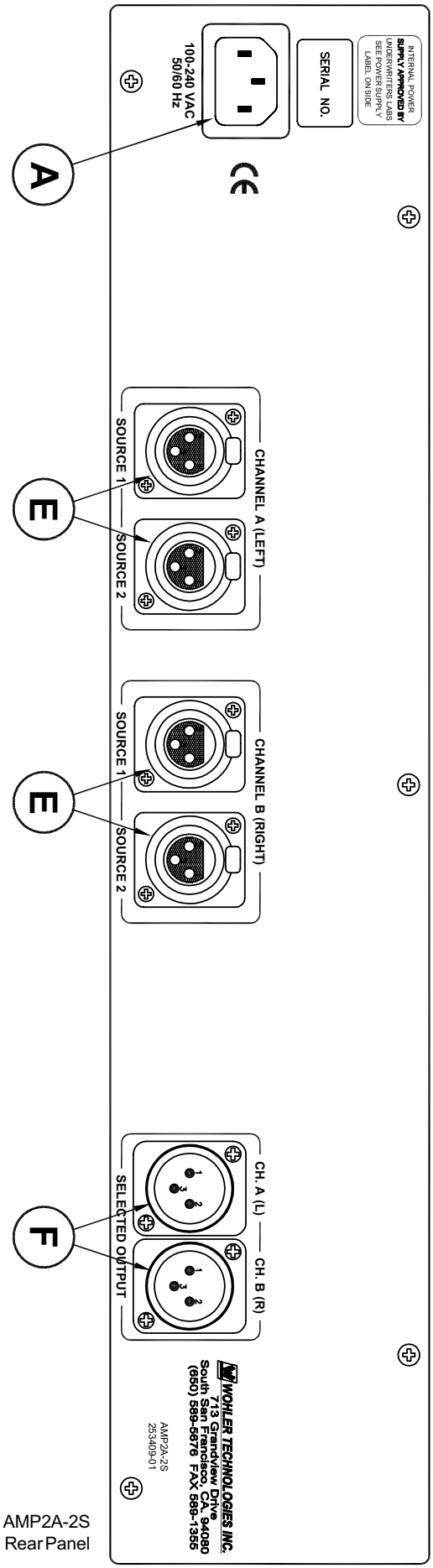
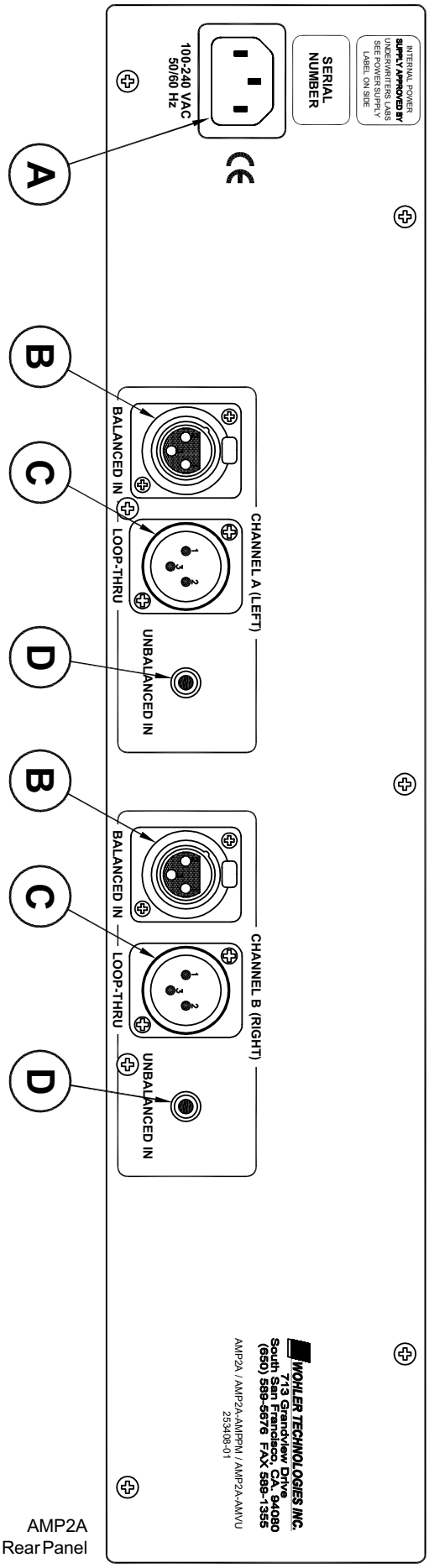


AMP2A-2S
Rear Panel



AMP2A
Rear Panel

Figure-2b: Rear Panel Features

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Section 3

Technical Information

- **General Technical Observations**
- **Level Meter Settings and Specifications**
- **LED Bargraph Driver PCB (919030) Description**
- **Level Meter Bargraph "0" (Zero) Level Fine Adjustment**
- **Level Meter Bargraph Peak LED Segment Adjustment**
- **AMP2A Interconnect Block Diagram**
- **AMP2A-2S Interconnect Block Diagram**

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General Technical Observations

General Mechanical Observations

Elimination of cabinet and component sympathetic vibrations (resonances) requires considerable attention to mechanical details. Because of this, and the physical constraints of the speaker's acoustic enclosures, even minor changes to any of the mechanical details of the unit can seriously impair its acoustic performance. This especially applies to the speaker baffles. If mechanical work on the unit is necessary, be sure to make adequate notes to permit accurate reassembly.

Unfortunately, the unusual and wholly proprietary method of magnetic shielding is usually degraded slightly by any disassembly of the unit, except removal of the rear panel. Almost any maintenance or repair will require removal of the cover. If an immediately adjacent video monitor shows magnetic interference after reassembly of the unit, it must be returned to the factory to restore the shielding completely.

General Audio Circuitry Observations

The **AMP2A** series units may use one of two possible Audio Amplifier PC boards; the 919100-2 or the 919164. Both amplifier circuits offer the same specifications and performance. Improvements of the 919164 over the older 919100-2 have to do prmarily with manufacturability. The following descriptions are applicable to both amplifier designs.

Since a single-sided power supply is used, all amplifier sections are "biased" with a 1/2 supply reference, so all opamp signal terminals on the main board should have a DC level of +12V, +/-0.7V. Signal inputs to the main audio board from any of the input select circuits are via the balanced input stage, in lieu of the XLR analog inputs on the basic unit. Signal feed points for level meters and the phase indicator are immediately after the input stage, and before the volume control section. The signal pick-off for the headphones is after the volume and balance controls. Speaker muting is controlled by circuitry that senses connection of headphones to the jack.

The power amps are attached to an aluminum heatsink plate (which is also connected to the circuit common for these devices). The heatsink plate forms an operational module separate from the chassis, which allows access to the solder side of the circuit board while power is applied to the circuitry. To avoid thermal shutdown of the power amp(s), they should NOT be operated without their tabs being fastened to the heatsink plate.

Variations in the frequency response of different production runs of drivers sometimes requires minor adjustments in the equalization/crossover components in individual runs of units. Some of these components may have values slightly different than those indicated in the schematic, which are the nominal ones. If any of the drivers (speakers) are replaced, it may be helpful to change some of these components to achieve maximum flatness of response.

The operating threshold of the woofer limiter is critical to both satisfactory reproduction of musical transients and preventing damage to, or destruction of, the speaker itself. The side speaker output limiter circuits are similarly important, though not as critically adjusted.

The woofer power amps are arranged in a bridge configuration; care must be taken to avoid letting EITHER speaker terminal contact the chassis (common) OR THE GROUNDED LEAD OF ANY TEST EQUIPMENT so as not to short out the power amps. The side speaker outputs are single-ended, so these precautions are not necessary for them.

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Level Meter Settings and Specifications

Level Meter DIP Switch Settings

Two DIP switch modules, accessed through holes in the top cover, allow the user to set the **VU/PPM Display Mode** and **Input Level Gain Calibration**. There are two DIP switch modules; one for *each* of the two meter bargraphs. There are four sections (**1, 2, 3, 4**) on each DIP switch module. The first two sections (**1** and **2**) are for setting the level meter **Input Level Gain Calibration** and the second two sections (**3** and **4**) are for setting the **VU/PPM Display Mode**.

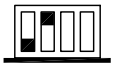
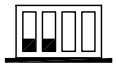
Input Level Gain Calibration Settings:

DIP switch sections **1** and **2** set the level meter **Input Level Gain Calibration**, which determines the level of the input signal that will result in a "0" reading on the meter bargraph. The factory setting is +4 dBu, but can be set for -6 dBu, 0 dBu, or +8 dBu by the user. See the diagram below for settings.

Bargraph Display Modes:

DIP switch sections **3** and **4** determine how levels are displayed (**PPM** or **VU** mode characteristics). The factory setting is **VU**. See the diagram below for settings.

AMP2A 20-Segment Bargraph Level Meter DIP Switch Settings (719030 PCB)

Gain Calibration				Display Mode	
					
-6 dBu	**0** dBu	**+4** dBu	**+8** dBu	**PPM**	**VU**

Installation Note: The two level meter **Input Level Gain Calibration** and **VU/PPM Display Mode** DIP switch modules are accessible through openings in the top cover of the unit. Any adjusments to the DIP switch modules should be performed *before* installing the unit into an enclosed rack.

LED Bargraph Level Meter Specifications

Level meter type:	LED bargraph display
Segment quantity:	20
Meter display modes (DIP switch selectable):	VU or PPM
Level gain (DIP switch selectable):	-6, 0, +4, +8 dBu
Level meter scale:	+4 (peak) to -40 dB
Dynamic range:	44 dB
Midscale resolution:	1 dB
Bargraph Length:	2" (50.8 mm)
LED segment pitch:	0.1" (2.54 mm)

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LED Bargraph Driver PCB (919030) Description

Input Stage and Level Calibration

The PPM-2 display driver PCB circuit (P/N 919030) provides a total of 44 dB of visual audio level indication via a 20-segment LED bargraph.

The main PCB's input buffer amps pass unbalanced signals through a DIP switch selectable attenuator pad on each 919030 meter driver PCB. A choice of four different reference levels, -6, 0, +4, and +8 dB for the 0 dB indication are available for selection by the user. A chart showing these input gain calibration settings can be found on page 17 and on a label on the top cover of the AMP2A unit.

Each of the differential outputs from the meter driver's input buffer drives a half-wave rectifier circuit, IC6a for positive input excursions and IC5b for negative ones. The outputs from the rectifier stages are combined and presented to two different filter circuits that generate both PPM (IC3B) and VU (IC4) characteristic signals.

Display Mode (Meter Ballistics)

When DIP switch section **4** is open and **3** closed, the **PPM** signal drives the display circuitry. This signal is created by IC4B and associated circuitry. A positive signal from the rectifiers causes the opamp output to go high turning on Q1. This charges C10 through a reverse protection diode (D2) and a resistor (R18). When the signal level decreases, Q3 turns off and C10 discharges through R15 and R9.

Closing DIP switch section **4** and opening **3** allows the **VU** signal to drive the bargraph drivers. This signal is generated by IC3a and associated components configured as an active filter to provide the proper **VU** characteristic.

Bargraph Driver

The signal (**PPM** or **VU**) directly drives the LM3916, which drives the upper bargraph display. IC4a provides an additional 16 dB of gain to the lower bargraph display driver (LM3915). D1provides the reference supply to all opamps and both LM391x display drivers. The LED drive current (brightness) is about 10x the current taken from pin 7. Pins 6 and 4 are the top and bottom connections to the reference dividers inside the display drivers. The voltage across R1, P1, R2, and DP1 is the reference against which the rectifier output applied to pin 5 is compared. The **Meter Zero "0" Level** is calibrated by adjusting **P1**. See page 19 for setting instructions.

NOTE: The driver PCB connects the LEDs in each bargraph in two SERIES strings (one for the upper, and another for the lower). The anode of the LED corresponding to the LOWEST input level in each string (-10 or -40) is connected to V+, with the other 9 LEDs (8 in the upper one) following; the outputs of the 3915/16 are connected to the node between each LED. Only ONE output of the 3915/16 is active (LOW) at any one time (“dot” mode), so if the LED string is “broken” (open) at any point, the bargraph in that half of the display (only) will go OFF whenever the input level is AT OR ABOVE the level corresponding to the break! IC5A is configured as a comparator, nominally set at 6 dB above “0” to drive the topmost segment of the upper bargraph display as a peak indicator. The **Peak Segment Threshold** is set by **P2**. Factory setting for **Peak Segment Threshold** is +9.5 dBu. See page 19 for setting instructions.

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Level Meter Bargraph "0" (Zero) Fine Adjustment

1) Removal of the Top Cover

Remove the top cover screws (2 along upper front panel, 2 per each side, 3 along upper rear panel, 1 center top). The 919030 PCBs (2 each) are vertically mounted to chassis bottom just behind the front panel mounted LED bargraph displays; one for each bargraph.

2) Adjustment Pot Locations and Functions

Locate **P1** on the 919030 bargraph driver PCB(s) you wish to adjust. The **P1** trimpot faces upward from the PCB edge. Of the two trim pots visible (P1 and P2) it is the *closest* to the front panel as mounted to the chassis. See the 919030 PCB layout on page 24 for location of **P1**.

3) "0" Fine Adjustment Setup

To the the input of the bargraph you wish to adjust, connect an analog audio signal of an amplitude of approximately 1 kHz of the amplitude desired to give a "0" indication on the bargraph.

4) Fine Adjustment of the Bargraph "0" Level

Turning the **P1** pot clockwise *increases* the *displayed* level (sensitivity) of the associated bargraph meter. For example, to set the zero level at +7 dBu (rather than the factory default setting of +4 dBu), adjust the level Input Gain Calibration DIP switches (see page 17) for gain closest to that desired. Feed an analog audio signal of +7 dBu amplitude (see step 3) into the input on the rear panel, then turn the pots *counter*-clockwise as you visually monitor the associated bargraph meter on the front panel until the desired display setting ("0") is achieved for the increased input level. To zero the meters for a lower input level, you would turn the pots *clockwise* to increase the displayed level for any decreased input level.

Level Meter Bargraph Peak LED Segment Adjustment

1) Removal of the Top Cover

Remove the top cover screws (2 along upper front panel, 2 per each side, 3 along upper rear panel, 1 center top). The 919030 PCBs (2 each) are vertically mounted to chassis bottom just behind the front panel mounted LED bargraph displays; one for each bargraph.

2) Adjustment Pot Locations and Functions

Locate **P2** on the 919030 bargraph driver PCB(s) you wish to adjust. The **P2** trimpot faces upward from the PCB edge. Of the two trim pots visible (P1 and P2) it is the *farthest* from the front panel as mounted to the chassis. See the 919030 PCB layout on page 24 for location of **P2**.

3) Peak LED Segment Setup

To the the input of the bargraph you wish to adjust, connect an analog audio signal of an amplitude of approximately 1 kHz of the amplitude desired to give a "Peak" indication on the bargraph (top segment).

4) Fine Adjustment of the Peak LED Segment

Turning the **P2** pot clockwise *increases* the *displayed* level (sensitivity) of the associated bargraph meter. For example, to set the Peak LED Segment level at +10.5 dBu (rather than the factory default setting of +9.5 dBu), feed an analog audio signal of +10.5 dBu amplitude (see step 3) into the input on the rear panel, then turn the **P2** pot *counter*-clockwise as you visually monitor the associated bargraph meter on the front panel until the desired display setting (top segment) is achieved for the increased input level. To "peak" the meters for a lower input level, you would turn the pots *clockwise* to increase the displayed level for any decreased input level.

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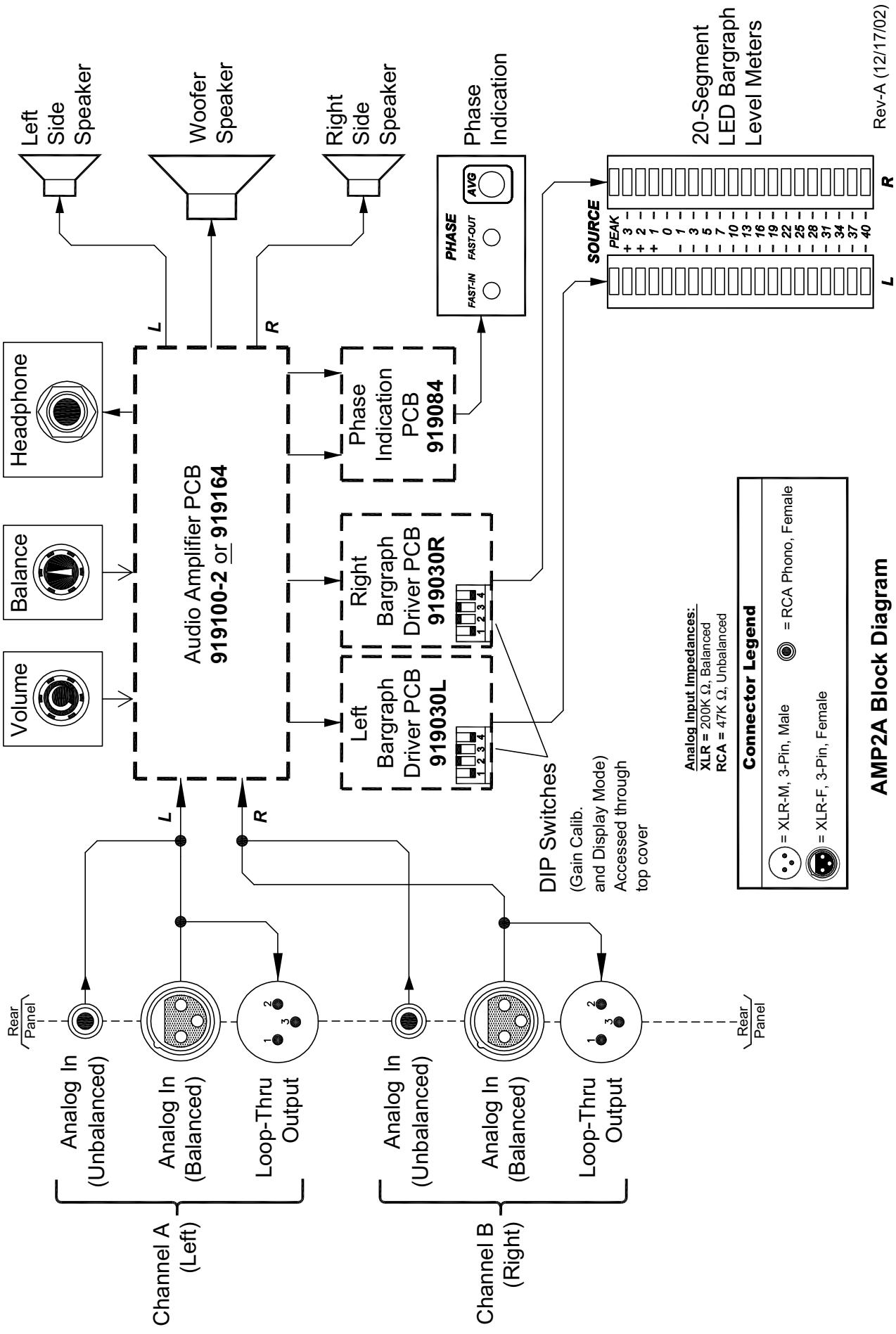
AMP2A Interconnect Block Diagram



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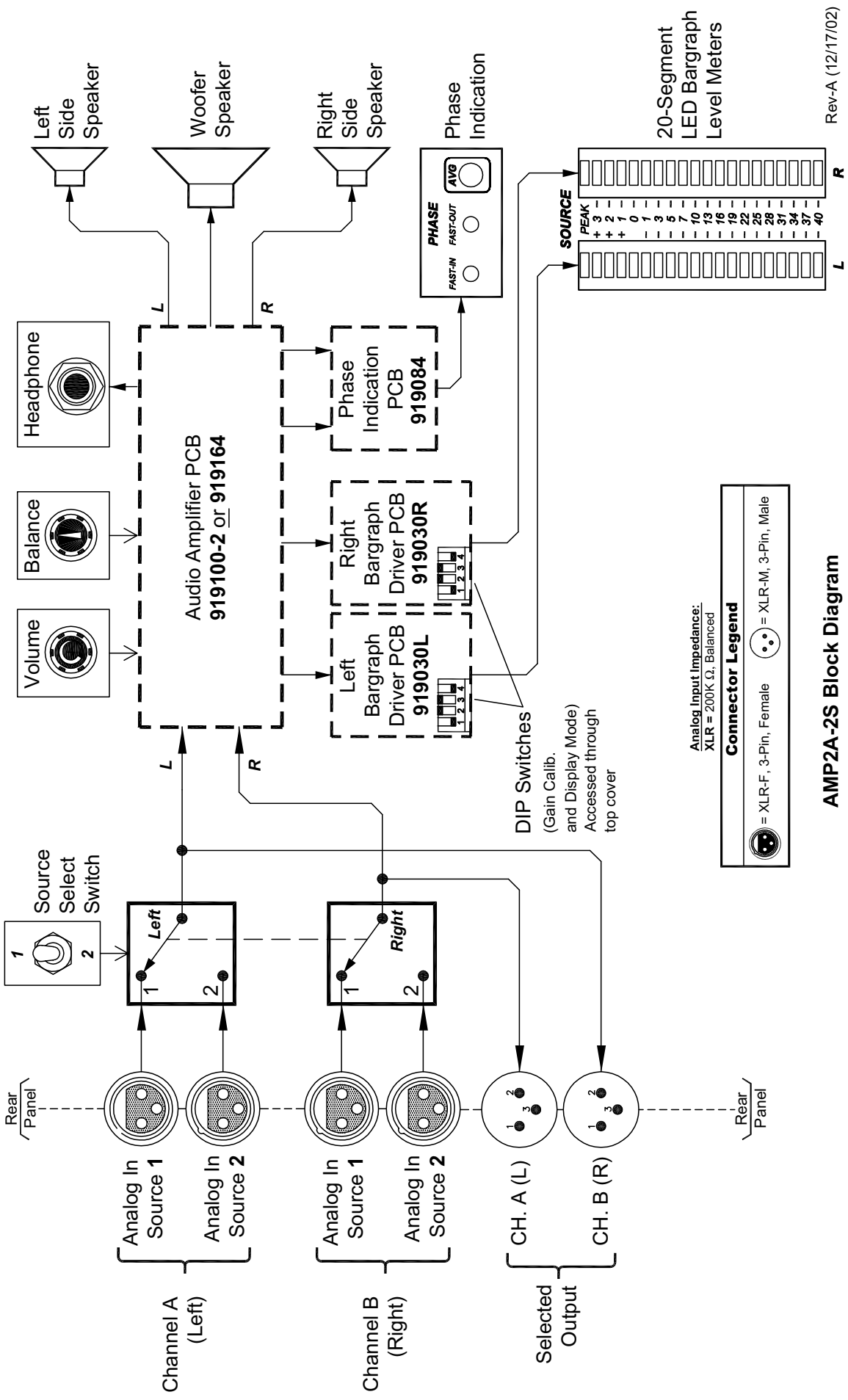
AMP2A-2S Interconnect Block Diagram



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